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Volume XIV JANUARY, 1934 Number 9

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Next Month

• Heinz Rosenberger, R.R.M.S. of the Rockefeller Institute, will have an article on "Motion Pictures as an Aid in Science." In this article Mr. Rosenberger tells of his many experiments in this line of endeavor.

• There will, of course, be another article on Miniature Photography contributed by an authority on this type of photography.

• American Society of Cinematographer members will contribute timely and illuminating articles on the various phases of photography as it is practiced in the studios.



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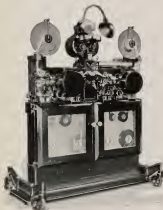
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Panorama Pictures With Your Leica

tw

Clarence Slater, A.S.C.

WHO has not longed to record as much of a distant landscape view, as the eye sees. The sweeping expanse of a cloud festooned sky, set off by a jagged mountain range or a city skyline. Perhaps there were also times when you wished to photograph large groups of people or an interior and then gave up because the task was seemingly impossible. The angle of your lens could not include the full subject or if it did the view was not satisfactory. There was so much distracting foreground that the subject seemed relatively small and unimportant.

It has been stated that the eyes take in an angle of 170 degrees, but that they see only 2 degrees of this angle in focus at one time. Nature provided this trick arrangement for the purpose of concentration. Comparing the angle of view as seen with the eyes with the angle of 50mm lens or less, we find that the camera on the horizontal plane photographs approximately one-fourth of what is seen with the eyes. It would be a logical assumption that wider angle lenses should be used more generally. However, the error of this is seen when we remember that the eyes see only two degrees in focus. Also that perspective and other things enter into the argument in favor of the lenses most frequently used now.

The focal length of the eye is naturally the same whether we are viewing a landscape or the detail of a barn. What is desirable then is to be able to photograph a wide angle and still retain a perspective that is comparable with that of the eye.

There are four methods of making panorama pictures. First of these methods fulfill the above condition. First, we have the so-called Panorama camera. This camera is equipped with a lens of a very short focal length. It embraces a field of about 110 degrees. Second, we have Panoramic Kodaks which use normal focal length lenses to cover fields of 212 and 142 degrees. This is accomplished by swinging the lens on its axis to describe a half circle while the film lies in the circumference of this half circle. All of the film that lies in the focal plane is not exposed at the same instant, but as the lens describes its arc. The third method is the Cirkut camera. This camera can use lenses of various focal lengths. The panorama is made as the camera is turned on its

(Continued on Page J176)





The above sketch shows an optical system designed to progressively increase the illumination from the center to the edge of the screen.

Problems of Background Projection

by

Hartley Harrison

Optical Engineer

SINCE practically all users of transparency projection have standardized on using a Bell & Howell camera movement in the projector and are also registering the film on the same relative perforation holes that were used in taking the picture in order to secure maximum steadiness, the problems of mechanical handling of the film have been fairly well standardized and the results are commercially practical for film speeds of 24 frames per second.

The optical problems, however, have not been carried to the same point of refinement as that the first transparency projection attempts had a decided hot-spot in the center of the screen, and after several years of using transparent projection, we still have the same hot-spot. The only thing that has been done to overcome this was to move the projector back far enough from the screen to just get by the falling off on the edges, which is not a correction of the condition, but merely a reduction of its apparentness photographically.

It might be well to review all of the causes of the hot-spot condition before attempting an explanation of a possible correction. We will therefore marshal the causes together for a review.

The first one is that the original negative will fall off on the edge due to the photographic lens, the amount of fall-

ing off varies from very slight to very pronounced, depending upon the lens. Second, an additional falling off will be had on the step printer due to the lens. Third, an additional amount on the projection which is the worst offender. This we will analyze in more detail later on. Fourth, there is additional falling off in the re-photographing on the process screen, due, as in the first instance, to the lens on the camera, and Fifth, there is another step in the falling off process when it is projected on the theatre screen. The amount of falling off on the edges each lens will give is open to a great deal of argument and we will not attempt to discuss that phase here. The only real significance the five steps have in so far as this discussion is concerned is to point out that in all of them you strive for as little loss on the edges as possible, and that no place in the process is there any attempt to build up the edges to compensate for the accumulation of losses.

In transparent projection, there are four vital factors, not including the projection lens, which we have mentioned and enumerating them in the sequence in which they come they are: The condensing system, either mirror or lenses; the angle of the projected beam, the screen and the camera angle, of these the screen, the camera angle and the angle of the projected beam probably play the most important part.

The importance of the screen lies in the fact that as a fusing medium it is intended to diffuse the projected beam equally in all directions. However, even on a chalk wall, which will give the maximum even diffusion by reflection, this condition cannot be obtained due to the edge of the beam striking the wall at a different angle than the center of the beam and this condition is aggravated when a translucent screen is employed because any translucent screen is only a partial diffuser.

Referring to the illustration it will be seen that the only illumination which can reach the camera from the screen are the diffused rays which are of such an angle that come within the scope of the camera lens angle, and this angle progressively increases from the center of the screen if the camera is in the center, and which therefore is the zero angle, to the edge of the screen where it is maximum. Now, in order for the transmission of the screen to be high so as to obtain sufficient exposure on the negative, the diffusion of the screen must be low, yet in order to pick up the marginal light from the screen, the screen must have a high diffusing property, and these two opposites cannot be reconciled, with the result that all translucent screens with sufficient transmission qualities to give adequate exposure allow a large percent of the projected beam to pass through

Continued on Page 356

The "Language of Line" in Photography

by

L. Owens Huggins, A.S.C.

Editor's Note: This is the first of a series of articles on the fundamentals of Photographic and Cinematic Design. In later articles Mr. Huggins will discuss Harmony, Rhythmic Balance, Tone (or Key), Measure, Contour, and Emphasis.

IF Photography has gained any consideration as an Art, it is not because photography is in itself an art, but because some photographers are Artists. It is not simply that these men are masters of photomechanical technique, but that they are masters of the technique of visual Art. They know the language of Art—and make their cameras speak it. They know that certain arrangements of lines, forms and masses, of light and shade, will not only create a picture, but will speak to the emotions "with a most miraculous organ." And they are daily applying these principles to even the least-important scenes, raising Photography and Cinematography from its original status of a mechanical process to an Art.

In its beginnings, photography was devised solely as a mechanical means of making a lasting, visual record of persons, places and things; and when cinematography came into being, nearly a century later, its purpose was the same, save that it had the additional advantage of being able to record motion, as well as form. Even today, with the benefits of our most perfected equipment and materials, no picture made by photography or cinematography can in itself be considered as more than a record, unless its maker has applied the basic principles of Art to its making. A beautiful scene, photographed, is often of far less artistic worth than an ordinary scene, beautifully photographed. As Daniel B. Clark, A.S.C., so unceasingly points out, "Art is not WHAT—but HOW."

Every picture or photograph is essentially a combination of lines, and every picture is—or should be—dominated by some definite type of linear design. Upon analysis, any picture ever made can be reduced to the pattern of its dominant lines. The more carefully composed a picture is, the fewer and more expressive will be its basic lines; and the nature of these lines will determine the emotional response which the picture will create.

Long, horizontal lines, for instance, suggest calmness, serenity, peace, quiet, tranquility; sometimes (it is but a step), death and finality. An example of this would be



Upper sketch illustrates strength of vertical lines. Lower sketch illustrates action indicated by diagonal lines. Lower sketch is drawn from photo by Axel Eshsten entitled "Work."

the horizon, or a body lying prone upon the ground—and who cannot remember the unforgettable massacre scene in Eisenstein's "Potemkin," which was played against the horizontal lines of the broad terrace of the Odessa waterfront?

On the other hand, the most attractive and commanding line in art is undoubtedly the vertical one. It signifies strength, stanness, and courage; long verticals speak of majesty, grandeur, sublimity. The illustration shows this more clearly, however, than any words.

The curved line, containing as it does a constant change of direction, is more interesting, more varied, and less stern than a straight line. Curved lines give us beauty, grace, interest and variety. They are most useful, however, when used in conjunction with straight lines, for the contrast brings out the best features of each. Curved lines, too, are extremely useful for leading the eye into a picture, or focusing the attention upon the principal object of interest. They are, therefore, more properly auxiliary than primary.

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As to Cinecolor

by

W. T. Crespien

Vice Pres. Cinecolor Inc.

DURING the past year, the field of natural-color cinematography has broadened appreciably. There has been a renewed interest in color on the part of producers, and side by side with this renewal of interest, more than a few advances in the various phases of color-cinematography. These advances have been largely in the way of improvements of photographic and laboratory technique, and they give assurance not only of better technique, and consequently better color, but of a more consistent, commercial product.

During this period, a new process of color-cinematography, known as "Cinecolor," has been placed on the market. It combines a number of well-established features with several new and—to this writer, at least—advantageous methods of detailed procedure.

It is well known that present natural-color processes are divisible into two classes: the familiar "filter-method," in which, by one means or another, two or more separate images are made through suitable filters, and later recombined in the printing process, and dyed, to form a single colored image; and the "bi-pack method," using two films—an Orthochromatic emulsion incorporating a red filter analogous to the Wratten 23-A, and a standard Panchromatic film, these two are run through the camera with their emulsion sides in contact, and the "red-Ortho" nearest the lens, thereby securing two color-separation negatives in perfect registration, which can be recombined in printing. The former method is undoubtedly superior in the degree of control allowed by the many possible filter-combinations, but it is often subject to fringing, or imperfect registration. The latter usually allows of less photographic control, though a great deal may be done by balanced processing of the two negatives; but it ensures perfect registration, and often greater speed.

Cinecolor utilizes either of these methods, depending upon the nature of the subject. For the straight run of production negative, the bi-pack method is employed, while for special work, such as cartoons, the filter method may be used. Obviously, the filter method cannot be employed for action negatives unless a special camera, having two lenses or suitable prisms ("beam-splitters") to allow the pair of images to be photographed simultaneously, is used. But in cartoons, there is no physical action between the pair of exposures, and therefore filters of the rotating type may be used, either before or behind the camera lens. By this

method, unusual effects can be obtained because of the great number of filters and combinations of filters available.

Essentially, Cinecolor is a two-color, subtractive process, synthesizing the colored image from two separation-negatives representing, respectively, the blue-green and orange-red components. For production work, as has been said, the bi-pack method is used, while for cartoon and title work, the filter method is preferable. Neither of these methods is new, the advantages of the process are to be found, instead, in certain operative improvements in photography and processing.

In photography, perhaps the outstanding feature of the process is the fact that a systematic method of exposure-determination is employed. Cinematographers who have had the greatest experience in natural-color cinematography will themselves be the first to admit that in such work, the customary method—reliance upon the individual's experience and judgment of light and reflective values—is far from perfection. Therefore, in the operation of the Cinecolor process, we have attempted to replace this somewhat inconstant factor with some more nearly scientific method. The method chosen is the one described by A. M. Cundelinger and J. W. Stafford in the journal of the Franklin Institute (Vol. 215, No. 1, January, 1933). Essentially, this consists of the use of a gray chart, of known density and reflective value, which is held in front of the subject before making a scene. The brightness of this chart is measured by photometric means, and the factor thus obtained is translated into specific photographic terms by reference to a special nomographic chart. In this connection, the new photoelectric photometric exposure-meters should, if suitably calibrated, simplify this procedure very appreciably.

The usual method of photographing a developing-test is also eliminated. A gamma strip is made of each negative emulsion used, this is developed, and densitometric readings made. From this reading, the developing-time for the emulsion is calculated. Thus, providing the above-mentioned method of exposure-determination is used in photographing, a perfect negative will result. This system has been found to be so accurate that only one positive test is needed to determine printing density, although there may be any number of different camera set-ups. The positive test,

(Continued on Page 256)

Cinecolor Processing Department





PHOTOGRAPHY

of the MONTH

"GALLANT LADY"

20th Century Production
United Artists' Release

Photographed by **J. Peeverli Marley, A.S.C.**

"Gallant Lady" is decidedly one of the year's best productions from every angle—especially the camera-angle. From the dramatic opening, in which newsreel stock-shots of de Pinedo's spectacular airplane-crash are used to great advantage (almost the first instance in memory in which such stock-shots were really up to production-photography quality), to the final fade-out, "Gallant Lady" is an outstanding example of fine cinematography. Not only is it some of Cinematographer Marley's finest work, but it is Marley in a new mood, deft, subtle, high-key cinematography of a style which this writer, at least, does not remember having seen in any of Mr. Marley's recent work. Without in the least belittling Cinematographer Marley's previous achievements—which have been more than notable—one cannot help consenting that "Gallant Lady" marks a definite advance in his career.

The diffusion continuity is perfect, moreover, there is an unusual demonstration of the dramatic utilization of the several different methods of diffusion, each building to its definite photo-dramatic effect. Incidentally, the laboratory-workers on the production deserve a palm for an excellent print.

"ESKIMO"

Metro-Goldwyn-Mayer Production

Photographed by **Clyde de Vinna, A.S.C.**, with
Joshua Roberts, A.S.C., Leonard Smith, A.S.C., and
George Negle.

It is safe to say that few, if any, major productions have ever been produced under such tremendous difficulties as attended the birth of "Eskimo." Months upon months of heartbreaking toil in the Arctic, with the thermometer registering forty and fifty degrees below zero, with storms raging, ice grinding, and everything as far as possible from being favorable to production, and yet Cinematographer De Vinna and his associates have turned on, to bring home a most remarkable film. The technical and artistic quality of the film are surprising. Of course, the frigid North does not offer such golden opportunities for outdoorism as do De Vinna's more familiar South Seas; but what there was, De Vinna brought back, as nearly idealized as the material allowed. Moreover, the film constitutes at once an important record of the lives, habits and speech of the Alaskan Eskimo (the dialog is almost entirely in the native tongue) and highly unusual entertainment.

Leonard Smith, A.S.C., deserves the highest praise for his handling of the whaling sequence. It is living, breathing ACTION, raised to higher peaks than anything seen since sound came.

As interesting side-light on "Eskimo" is the fact that the leading role of "Malu" is played by the only Eskimo

cinematographer in the world; Ray Wise (Abghichuk), who was, as old-time readers of this journal will remember, for many years Dan Clark's Assistant Cinematographer. He gives a more than good account for himself as an actor. It may be mentioned, too, that both the author and the director "doubled in brass," playing two of the few Caucasian parts in the film.

"MY LIPS BETRAY"

Fox Production

Photographed by **Lee Garmes, A.S.C.**

This is the production which, due to its resemblance to "Adorable," was shelved for six months, and preceded by "My Weakness." It is in every way a superior production to its predecessor, far and away the best musical film thus far turned out in America. It is true cinema, in the first place, and excellently directed and played. Moreover, Lee Garmes' photography is exquisite—far and away ahead of even such highly praised films as "Zoo in Budapest." Decidedly, it is Garmes at his best.

Every scene in the production is a gem of composition and perfected lighting—pictorial in the extreme, without in any way distracting the attention from the action. The presentation of the musical numbers—especially "His Majesty's Car"—is excellent, and often quite original, the treatment allows for the legitimate use of really interesting angles. The "gossip" sequence is also interesting from the photo-directional standpoint. In fact, the only major flaws in the production are the cutting—which could have been lightened to good advantage—and the title, which should have remained as it was originally, "His Majesty's Car."

"SITTING PRETTY"

Charles Rogers-Paramount Production

Photographed by **Milton Krasser, A.S.C.**

This film is at once the most pretentious of Charles Rogers' productions for Paramount, and the best opportunity yet given that rising young man, Cinematographer Milton Krasser, A.S.C. It is exceedingly well photographed—especially some of the musical interludes—and Cinematographer Krasser has also had the benefit of much better laboratory work than he has been privileged to have before. The net result is an interesting little film, with a great deal of interesting camerawork. One must make special mention of the "Fan Dance" sequence, which is by long odds one of the most spectacular dance sequences in any recent film. Done against a plain black background, with dancers clad largely in huge black-and-white fans, and elaborated with the innumerable visual tricks possible with the mirrors contained in the black panelling of the set, the effects achieved by Cinematographer Krasser are amazing. At times the illusion of depth is uncanny. One might criticize the cutter, however, for having used so few of the long-shots, in which the spectacular qualities of the scene are best exemplified.

"HOOPLA!"

Fox Production

Photographed by **Ernest Palmer, A.S.C.**

Another of Cinematographer Palmer's cinematographic idyls. Beautifully photographed throughout, Clara Bow has rarely been photographed more advantageously than in this tale of the carnival business. The production, however, gives rise to a question of cinematic psychology in the manner in which Cinematographer Palmer idealizes the tawdry glamour of the sideshows, has he not idealized too much—done his work too well? It would appear, to this writer, at least, that he could have built to a stronger dramatic effect had he restrained his pictorial tendencies until the love-theme began to develop, thereby creating a visual contrast better in keeping with the emotional contrasts and development of the plot.

"THE PRIZEFIGHTER AND THE LADY"

Metro-Goldwyn-Mayer Production

Photographed by **Ted Tetzlaff, A.S.C.**, and**Lester White, A.S.C.**

This is far from the "special" or "epic" type of film—but it's grand entertainment. Made and re-made under difficulties, it hardly represents the acme of photographic perfection, yet comprises much that is praiseworthy. The handling—photographic and directorial—of the climactic prizefight sequence—a real "Battle of the Century," between Max Baer and Primo Camera, with Jack Dempsey as referee—is undoubtedly the outstanding bit of technique, it is treated as a silent picture, with practically no dialog, and aided by excellent sound-effects. The photography and cutting of this sequence deserve the most careful study by all cinematographers, especially the amateurs. Amateur directors, too, should study Max Baer's performance in the leading role, which offers evidence of what a capable director like W. S. Van Dyke can do with inexperienced actors.

"FLYING DOWN TO RIO"

RKO Production

Photographed by **J. Roy Hunt, A.S.C.**Special Effects by **Vernon Walker, A.S.C.**, and**Lynn Dunn, A.S.C.**

Inevitably, "Flying Down to Rio" will be compared with its predecessor, "Melody Cruise"—but aside from the fact that both are examples of Producer Lou Brock's distinctive conception of filmicals, the two productions hardly warrant comparison, for the newer film is, in every department, far and away superior to the earlier one. It is embellished with dramatic and technical novelties, as was its progenitor; but it has a better foundation of plot and personalities, and the technical treatment is immeasurably smoother and more finished.

We happen to know that Cinematographer Hunt made the picture under extremely difficult circumstances, but notwithstanding this, he comes through with flying colors. His treatment of the players is more than up to his best standards, Dolores del Rio has seldom appeared to such good advantage, while Gene Raymond seems far more virile than usual, under Hunt's ministrations. Every scene is a more than ordinarily interesting composition—effective, without being studiously so. Art Directors Van Nest Polglis and Carroll Clark have furnished strikingly unusual sets, which allowed Hunt unusual opportunities for pictorial camerawork—and he didn't miss a single opportunity. Director Thornton Freeland, too, deserves an orchid for his highly photogenic direction, especially of the dance-sequences. In these he applies the moving-camera technique generously, but in so rhythmic a manner as to be really desirable. Directors and cinematographers everywhere could benefit from study of this phase of the film alone.

Vernon Walker, A.S.C., and Lynn Dunn, A.S.C., in their special-effects work, have added immeasurably to the production, in fact, many of the pivotal sequences depend wholly upon special-effects work of one kind or another for their "punch." Aside from the "Flying Down to Rio" sequence—which literally could not have been made without Walker's special-effects work—there are a number of other sequences which are directly dependent upon trick camerawork. A love-scene, for instance, between the two leads, is made particularly striking by the use of projected backgrounds in which the background is dissolved or "wiped" from one view to another every few feet. The Optical Printer work of Cinematographer Dunn, which so distinguished "Melody Cruise," is vastly matured in this film. He has devised an amazing new array of "wipes," "blends" and other optical transitions for the picture, and these fit beautifully into the production. Unlike those in the earlier production, they do not impress one as deliberate studied attempts at the outre, but as thoroughly natural transitions.

"DESIGN FOR LIVING"

Paramount Production

Photographed by **Victor Milner, A.S.C.**

When that inseparable team of Cinematographer Milner and Director Lubitch collaborate on a production, what can one say, other than that it is surpassingly delightful? Each of their films seems a bit better than its predecessor—and "Design for Living" is no exception to the rule. I had thought that "The Love Parade" and "Monte Carlo" marked the highest peaks possible of attainment in the way of polished comedy and coordinated direction and camerawork—and then "Trouble in Paradise" came along and upset all of my previous ideas, now "Design for Living" has surpassed them all. Lubitch's direction of this sort of subtle comedy rarely leaves one a moment to consider the technique, and Milner's photography is so perfect, yet without so effortless, that it corresponds perfectly with the rest of the production. The only proper description is "flawless." Whether you are seeking entertainment, or a demonstration of perfected technique, don't miss "Design for Living!"

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A funny moment in the shooting of "Snooky" with **Samuel Clark, A.S.C.**, at the controls in the pit.



Fred
Jackman,
A.S.C.

Patents and the Cinema- tographer

Fred W. Jackman, A. S. C.

THE average cinematographer's attitude toward patents (in so far as they relate to his work) is a peculiar one. On almost every production he makes, he spends a great deal of time and effort in working out new ideas and methods, often new equipment, to enable him to do better work, but once he has perfected and used them, he accepts them as part of the day's work. The idea of patent-protection rarely, if ever, occurs to him; he isn't out to monopolize anything, but simply to turn out the best work possible.

I thought the same way myself. It took me eighteen years, and cost me and my producer many thousands of dollars to learn that patents aren't a sign of monopolistic intent, but simple insurance that you'll be able to use your own ideas, without interference.

Let's take what has recently happened to me as an example. A number of years ago, I worked out a certain method of process photography, using the well-known "Blue Transparency" process. Personally, I believe that I was the first in the field with it, maybe I'm wrong, for, after I had been using it successfully for a number of years, the same idea occurred to somebody else—and he patented his idea.

That left me in a mighty uncomfortable position, for even though I had been using the process for many years in my regular work, the other fellow had been the first to record the idea with the patent office in Washington. Such

being the case, he had every legal right to enforce his rights under that patent. In plain English, he could prevent me from using the process. Naturally, since he felt that I was infringing on his rights, he tried to stop me. The net result has been four years of litigation and the expenditure of thousands of dollars. And the most amusing part of the situation is that since then I have been allowed a patent on my own technique with the process—a technique which experience has shown to be the only method of getting quality results with the process—and as near as I can learn, the other fellow finds himself compelled to use this technique himself, even though he forgot to include it in his own basic patent!

Now, just how would a patent have helped me in this mixup?

In the first place, had I known what I know today, I would have gotten a basic patent when I first conceived the idea of color-separation process cinematography. I wouldn't have secured it with any idea of getting a corner on process work, but simply as a sort of insurance, so that I could be certain that I couldn't be prevented from using my own idea. Then, as I developed the technique of using this basic idea, I could have added supplementary patents covering the improvements, all for the same purpose. I would know I was free to develop and use my idea.

It's an absolute certainty that, no matter how original an idea may be, someone else, engaged in the same line of work and trying to get a similar result, will sooner or later parallel the original line of thought, and achieve a similar, if not identical, result. And any way you look at it, when two independent researchers have arrived separately at the same result, and each finds that the other has duplicated his methods and results, a great deal of unnecessary unpleasantness is bound to ensue before the question is satisfactorily untangled.

Then there is the appalling waste of time, effort and money involved. I have a pretty good idea of the cost of developing such a process; it took me a long time to do it, and cost a great deal in work, equipment and mistakes—and since the other fellow didn't know what I had done, or was doing, he undoubtedly duplicated most of my experience. He had to, to get the same result! And it was all so needless! Just think how much progress the industry would have made in that direction alone if whichever of us as came second in the matter had known of the other man's previous work, and instead of laboriously going over the same ground, had used the same ability, energy and money in either taking the problem up where No. 1 had left it, or in attacking the problem of process cinematography from an entirely new angle!

There, to my mind, is where we find the greatest value of patents. Suppose, for instance, that I get today what seems to me to be an entirely new idea in process cinematography. As soon as I have gotten far enough along to have a clear idea of how it ought to work out, I can ask the patent office whether or not they have a record of anyone else's having had the same thought. If their records show that I am in the clear, I can go ahead without fear or wasted effort. If they tell me that Joe Doakes has worked out the same process and been allowed a patent, I can save myself the cost of duplicating his work, then I have my choice of getting his permission to use his process, or taking up the problem from a new angle. Either way, I am benefitted, and so is he.

It would be a serious mistake to imagine that these remarks refer only to special-process cinematography. True

(Continued on Page 350)

A Question **ANSWERED**

WHAT big picture today does *not* include backgrounds that call for composite photography? The answer is obvious. . . . The really vital point is: what medium to use in photographing these important backgrounds? . . . Eastman has answered that question. Eastman Background Negative, with its remarkably fine grain, its surprising speed, and its excellent processing characteristics, completely solves the film problem of the composite shot. Eastman Kodak Company. (J. E. Brulatour, Inc., Distributors, New York, Chicago, Hollywood.)

EASTMAN
Background Negative



TREND of THE TIMES

Rubber Lens

• What is termed a "Rubber Lens" is described in *Filmtechnik*, a technical German publication. This is along the lines of the Bell & Howell Varo-lens, designed for obtaining the various focal lengths with one lens. The starting point of this lens is 25mm. However, there are different attachments to make the focal length more elastic. It is being manufactured by Astro.

Police Cameras

• The English police are going in for photography, according to *The British Journal of Photography*. This publication reports that the chief of police of Gravesend has equipped every policeman of his station with a Leica to secure photographic records of accidents and other incidents that may require photographs for accurate data for the courts.

Multiple Exposure

• An interesting item appearing in the *British Journal of Photography* relates of the manufacture of a camera which is of Danish origin and which by the simple turn of a crank gives 48 different poses of the subject on one plate.

Home Made Screen

• The French magazine "Revue Française De Cinématographie" gives a formula for the ambitious amateur to make his own screen. The base can be either canvas or the solution can be applied directly to the wall. The formula is as follows:

Water	1 litre
Gum arabique	50 grams
White magnesia	200 grams
Glycerine	10 c.c.

This is applied with a large flat brush and it is claimed to reflect 90% of the light. It is also the claim that it is superior to the metallized screen.

For those who prefer a metallized screen the author gives the following formula:

Burnt chalk	30 grams
Caseine	35 grams
Waterglass	10 grams

This must be mixed in a double boiler

After being warmed add 20 grams of whiting and 20 grams of aluminum powder. This is also supplied to the surface with a flat brush.

Old Man Photography

• The year 1933 marked the hundredth anniversary of the invention of photography. Just a century ago Niepce, a former French cavalry officer, discovered that it was possible to obtain a solar image. Niepce was really looking for an acid engraving process when he stumbled upon this new phenomena.

No Hot Spot

• In Holland it is claimed there is a development of a new type of flood light that does not give a "hot spot" due to its construction. This has a three-lamp arrangement with an adjustable reflector. It is by the moving of the reflector as well as by reason of the three lamps that the "hot spot" is eliminated.

Water Lights

• In the Vita Studio of Vienna Avastria a tank has been built for water pictures that is 30 feet deep containing a system of under water lighting built as a part of this tank.

Adjustable Walls

• The new Fox Studios just outside of Paris at St-Paul are claimed to have installed a new type sound stage which through a new system of adjustable walls and top ceiling they have been able to obtain a new perfection in acoustics. They also claim a mixing table that cares for seven sound tracks at one time for dubbing. This consists of four photographic discs and four dials.

Window Shot

• A practical suggestion for Interior Photography. It is always hard to guess the correct exposure for an interior shot which has windows in it. They usually come out a blurred white and all details of the exterior are lost, usually making an otherwise perfect shot.

This can be corrected by a very simple method of double exposure. Set up your

camera and make your shot of the interior desired but leave all the blinds of the windows shown in the shot drawn. Then close your shutter but leave your slide of your filmholder out and do not touch the camera. Open up the blinds in your set up and then open up your shutter for a short flash of exposure on the same plate. The result will be a perfect match and plenty details in your windows. This avoids all doctoring on your plate and well, you have learned something—From *Le Photo pour Tous*, Paris.

Hocus-Focus

• Do you know that you can make a complete photographic image disappear by simply painting it with iodine and then dipping it in hypo? Do you want to make a white background or make somebody in the picture disappear? With a little skill and a little fine brush apply your iodine and then let it dry for a minute, throw it into your hypo bath and wherever you applied the iodine a pure white space will appear. If necessary repeat the operation. —From *Le Photo pour Tous*, Paris.

Universal Filter

• "Camera", a Swiss magazine, in its July edition, 1933, published an interesting article written by Mr. Kellner who discusses the advisability of using a green filter on both panchromatic and orthochromatic emulsions for proper color rendition in black and white. He further discusses the different methods of manufacturing light filters, concluding that filters dyed while the glass is in a melted state are preferable to either gelatine filters or glass filters coated with dyed gelatine. No reference is made as to the influence or reaction of green filters relative to the original shape of the gradation, especially the gamma.

Fast Lens

• According to a report from Berlin a new lens is being marketed with a speed of F 11 in focal lengths including 20, 28, 42, 50, 75, 100 mm. This is being made by the Jäckerroll company. It is being put out under the name of the "Panitar".

AMATEUR SECTION



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Next Month . . .

■ We will have a very fine outline for a Home Movie that will intrigue you and tempt you to load your camera for immediate action.

■ There will be another installment in the series of Lighting Articles. We have already given you the laws of personal and set lighting. We will carry you further in this interesting study.

■ There will be an article on the developing of your own titles when you shoot direct positive. Review of the prize entry pictures indicated many are lacking in this knowledge.

■ Of course, there are only a few of the articles that will appear in the Amateur section. There will be many more illuminating and entertaining features.

Honorary Membership

Above is a reproduction of the Certificate of Honorary Membership tendered the **AMERICAN CINEMATOGRAPHER** by the Institute of Amateur Cinematographers of England.

This Institute has made phenomenal progress since its inception a little over a year ago and now numbers in its membership close to 500 enthusiastic cinematographers.

The American Cinematographer proudly acknowledges the honor conferred upon it by the Institute in the tendering of this Honorary Membership. It is also proud of the fact that it was given in recognition of the services so freely given to the Amateur throughout the world.

A perusal of the by-laws, aims and activities of the Institute of Amateur Cinematographers convinces one that it has been organized not only along ideal lines, but is substantially founded in its thought and its purpose and its activities. Its membership gives immeasurable benefits to those allied with this organization. It numbers among its associates the biggest of the dealers, manufacturers and distributors on the British Isles.

Its active membership reads like the blue book of England. At its head as president it has His Grace the Duke of Sutherland, K.T. It lists among its patrons about twenty of England's leading personalities. In the capacity of Honorable Secretary it has William E. Chadwick, F.A.C.I., an aggressive, intelligent and personable man who has builded well and firmly.

The American Cinematographer proudly acknowledges acceptance of the signal honor conferred upon it by the Institute of Amateur Cinematographers of England.



Randolph B. Clardy, winner of gold medal for Scenario and Photography, with his home camera

Editor's Note: Randolph B. Clardy, author of this article, was the winner of the gold medal for Scenario pictures and also winner of gold medal for photography in the American Cinematographer 1953 Amateur Motion Picture Contest. In this article he tells us something of the conditions surrounding the making of the picture which won him these honors.

Winning With An 8mm. Camera

by

Randolph B. Clardy

Winner of Gold Medals for Scenario and Photography

THAT peculiar sensation known to amateurs as the desire to film a story, had me sitting in obscure corners trying to squeeze a story out of my brain cells—one that could be produced without impossible complications and yet approach as nearly as possible the real McCoy. Driving out toward Newhall one sunny Sunday, I discovered an informal rodeo in progress, just off the highway

A perfect set-up for more camera fodder. I quickly made the acquaintance of Hosea Steelman, who was conducting the rodeo, and discovered that the rough-riding young boy capturing the center of attraction was not a boy at all, but his daughter Dolores Steelman can ride and rope with the best of the men, and I was surprised to learn that she could neither hear nor speak.

Later, in showing the results of the pictures taken that afternoon, I became better acquainted with Hosea and his daughter and their thorough enjoyment and interest in the informal reproduction of their rodeo secured by my small camera, served to stimulate my already growing desire to film a western story, with Dolores as the principal. I put it up to them and they were more than willing to co-operate in every way, having the ranch and the horses as well as a truck to transport them on location.

I at once set to work on my story. Almost every scene was mentally photographed, rather than written, by the time we started the work on the film.

I found that visualizing my scenes in advance made it possible to shoot them quickly without wearing out the actors as well as the cameraman.

Healing of the picture planned, a neighbor loaned a trained Palomero for a lead horse; another neighbor loaned calves for roping, another a wild horse from the Arizona Desert and a double offered his service for the dangerous bucking horse scene. Other neighbors generously loaned their ranches and cattle as the scenes required them.

The picture was made in two days, only to discover at the end of the second day that all of the film had been spoiled through my experimental tinkering with the camera, so that the diaphragm was only half open on all my shots. This was almost too much! And would the characters go through with it all again? They would, believe it or not! However, it was necessary to find a new leading man as the cowboy used previously had gone to a desert ranch. The scenes were retaken with some improvement, which gave all concerned consolation for the added work. And so to a completed picture.

With the aid of reflectors made of beaver board braced at the back and covered with metallic paper obtained at a sign painter's supply house, I was able to use back-lighting in practically all of the scenes. The reflectors built up exposure so that with good sunshine, I was able to stop down to "f-8" on the shadow side and "f-11" on the sun-side. This, in both instances, is a stop below those recommended for the camera without the use of reflectors. These smaller stops allow the 8mm picture to be projected sharply up to about a four-foot screen size, with a brilliant projector and screen. Ordinarily, a reflector was used on the faces at a three-quarter angle for accent lighting, and additional ones used wherever the surrounding set needed more light. Where the principals moved around, reflectors were set to catch them as they moved into a different area. Five reflectors, 30" x 40", were found ample for the scenes, used at a distance of from twenty to thirty feet. A substantial tripod was used throughout the entire picture.

To smooth out the technique in changing scenes, I used a wipe, which was obtained by moving a black blade across about an inch in front of the lens. The blade was hinged to the front of a box on a screw and the sides of the box extended back to clamp the sides of the camera. The box was painted black inside to prevent light flashes into the camera. One lap-wipe was obtained by checking the footage at the end of a wipe and then running the film on through, reversing and running through again and then again up to the beginning of the wipe. The lapped exposure was then wiped in from this point.

(Continued on Page 373)

Effects in Your Titles

by

George J. Lancaster, A.S.C.

TRIPLE exposures, wipe offs, dissolving and lap dissolving titles bring forth a new era in photographing titles, truly an art in itself. Title departments in major studios have slowly grown into a considerable institution with all sorts of new fangled gadgets and dodads that would fill a small volume if one were to write about them.

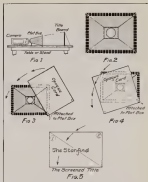
There are mechanical reasons why it is almost impossible to go into lengthy details concerning the operation of them and the resultant effects obtained from them. That leaves me face to face with a problem of explanations which I shall try to write in my humble way. The simpler operations in producing various effects which the 16mm producer might be inclined to try, may make truly novel titles for his or her films providing, of course, he or she owns a camera which has incorporated the variable shutter control, 8 to 64 speed control, hand crank, allowing for winding back the exposed film and the stop motion appliance.

The October issue, the article of Trick Photography, had much written about dissolves and lap exposures. The same principle is applied to the titles, so let us start with captions photographed over backgrounds, by double exposure.

Let us suppose you are covering a football game. Of course you will have some sort of continuity to your story. The campus would be an appropriate background for your main title. Secure a still picture of the campus looking at hand the captions on title cards describing the incidents and so forth.

First photograph the picture in sufficient length corresponding to the required length of your title card reading matter. This done, fade out, close shutter, wind back the footage, place the title card on the board, open shutter and start exposing and fade out as you have done on the picture. You have made a unique title with an animation. Now let us suppose it is desired to add a sub-title and you desire to have the main title letterings dissolve out as the lettering of the sub-title dissolves on. Example (1) "Stanford vs. California," the sub-title (2) "Leaving for the U. C. Bowl."

Operation: Photograph the picture background, ample footage exposed fade out, close shutter, wind back footage exposed. Place card No. 1 on board, open shutter and photograph half of exposed film of background fading out on title card. Be sure to note exact footage you started to fade out on and the exact length of fade out, as you have to repeat this operation. Shutter closed wind back to starting point, place card No. 2 on board. With shutter closed start camera in action just at the point where you started the fade out on card No. 1, start fading in on card No. 2, continuing on with the second half of exposed film of the background, fading out at the end as you have done on the background, leaving the title and background fade out together.



In Fig. 1 you have side view of camera, mat box and title board. Fig. 2 is front view of mat box, note white lines half inch apart. The size of the aperture opening should be twice the size of the title card, inside of mat box should be painted dull black. Fig. 3 shows the action of the wipe off card in downward motion cutting off title card at each exposure. This gives you the wipe-off. Fig. 4 shows card in downward motion, but this time instead of closing aperture it is opening the aperture and giving you a wipe-on. Fig. 5 is a diagram of film in up-and-down motion, the half marked No. 1 leaving the screen at the other half marked No. 2 comes on.

Now we come to an operation that is somewhat complicated, requiring the building of a large mat box to be placed before the camera lens for producing photographed wipe offs. No doubt the readers have often viewed titles in the theatre, where one caption leaves the screen, the other proceeds either across, right or left, or from up or down simultaneously. Note in the accompanying cut around the outer edges of the mat box are painted white lines half an inch apart. These white lines are used to guide each movement of the black mask card for making off the entire mat box aperture step by step, in accordance with the white lines. Operation: Set up first title card, generally the main title, focus camera through mat box. Photograph the required footage of main title, stop camera. The next procedure, photograph the title in stop motion. Carefully note footage at this point, for winding back. Now bring the black card into play. Start the card at first top white line and proceed down, stop exposure, move card to next white line, stop exposure, and so on until you have completely blanked off the opening of the mat box. Close shutter or cap lens, wind back the film to the point where you started stop motion, place credit title card on board, open shutter, now start exposing as you had done in the beginning. Instead of closing in on open aperture, start with mat box closed and open downwards from white mask to white mask, stop motion at each movement as you have done when you first started when the mat box is completely opened, proceed filming at regular speed 8 frames per second. Sufficient footage for reading exposed. You have obtained a wipe off effect worthy of praise and so I hope my readers will enjoy this prime of producing titles of this kind.



Above—the scene. Below—how it was done. “M” indicates position of Mother and “B” that of Baby. This is a medium lamp, fitted with a Photoflood bulb; the lampshade keeps the light from striking the lens in any position. 2, 3, and 4 are 500-watt photographic lamps, fitted with diffusers. 5-7 indicates position of lamp 5 for scenes 1, 7, and 22. Lamp 8 indicates camera position for most scenes; angle 8 is optional for closer scenes, especially 17-20; angle C is for scene 21. With Super-sensitive film, this lighting permits work of 4-5.



Introducing Baby

by
William Stull, A.S.C.

WHEN a cinematographer (amateur or professional) suddenly finds himself a proud papa, one of his first thoughts is "Where's my camera—I want a picture of the Baby!" But when it comes to actually making the pictures, he's likely to find inspiration an inconstant wench—looking steadfastly away from him. So here's a suggestion for Baby's filmic bow.

TITLE (5 feet)

MIL. and MRS. JOHN SMITH
Present
JOHN SMITH, JUNIOR
A SMITH PRODUCTION

INSERT 15-10 feet)

Your card announcing Baby's arrival

SCENE 1 (5 feet)

Fade or line in on long-shot of the Hospital where the baby was born.

CUT TO

SCENE 2 (8 feet)

Close-up of Hospital name-plate or cornerstone.

TITLE (5 feet)

DR. JONES—MASTER OF CEREMONIES

SCENE 3 (5 feet)

Close-up of the attending Physician—preferably talking.

SPOKEN TITLE (5 feet)

"Mother and baby are doing splendidly."

SCENE 4 (4 feet)

Long-shot of Mother in bed, smiling happily.

SCENE 5 (5 feet)

Close-up of Mother.

SCENE 6 (3 feet)

Close-shot of door opening.

SCENE 7 (10 feet)

Long-shot. Door opens, Nurse enters, carrying Baby. She crosses over to Mother's bed, the camera following her. She starts to put Baby in Mother's arms.

SCENE 8 (4 feet)

Medium close-shot of Nurse giving Baby to Mother.

TITLE (3 feet)

INTRODUCING BABY.

SCENE 9 (8-10 feet)

Close-up of Baby, nestled in Mother's arms.

SCENE 10 (6 feet)

Close-up of Mother, speaking.

Into this cut:

SPOKEN TITLE (5 feet)

"He looks just like his daddy, doesn't he?"

SCENES 11-20 (5 feet each)

At 16 scenes (preferably close-ups and medium-shots) of the Baby—cute expressions, etc. If desired, a shot of Baby taking his lunch, etc.

SCENE 21 (6 feet)

Close-up of Nurse, speaking. (Make this from low angle, shooting diagonally up, as though from viewpoint of someone in bed.)

Cut into this:

SPOKEN TITLE (5 feet)

"Time's up!"

SCENE 22 (8 feet)

Long-shot. Nurse picks up Baby, and walks out of door, closing it behind her. Camera follows her from bed to door.

SCENE 23 (4 feet)

Close-up of Mother, smiling happily. May be shot with slight diffusion.

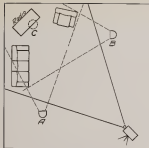
FADE OUT

TITLE

WATCH FOR THE NEXT INSTALLMENT—
COMING SOON!

Allowing for the inevitable "added scenes," bits of action which cannot be planned for, but are too good to miss, and also for the few inevitable "NG'd Takes," this should make a neat little picture of about 150 feet, though it can easily be trimmed to 100, or padded to a full 200. It requires specialized technique, of course, if it is to be filmed in the hospital, there are certain rules and regulations to be observed in most hospitals, which cannot be ignored. For instance, in most hospitals, fathers are never allowed to touch the baby—and seldom to even be in the same room with their infants, therefore, you will notice, "Father" does not appear in any scene in the film. After all, fathers are pretty inconsequential creatures at such a time! In

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A and B represent stand lamps while C represents a lamp suspended from the ceiling or otherwise put so as to throw its light directly down for back lighting.

ABC of Set Lighting

by

Arthur Campbell,
Cinematographer

JUST as there is a fundamental light in portraiture, there is also a basic method of lighting a set, and they are not dissimilar.

We know that one source of light, no matter where used, whether to light a person or set will create a shadow. If this light is placed directly in front of the set, facing it in the same way as the camera faces the set we will get a flat light. However, that is the most we can expect from one light.

There are times when shadows are desirable, but we will not go into that phase of lighting here. We will try to establish what might be a basic light for a set regardless of its artistic merits.

In view of the fact that it will be agreed that one light is not sufficient to light a set we will disregard the front lighting and place this first unit to one side as reasonably close to the objects as possible so as to throw the beam across these objects from one side. This will create a shadow which of course is undesirable as one side of the picture will be entirely in shadow.

But let's take an imaginary set such as is sketched on this page and assume that the first unit we have placed is light A. You can readily visualize how this would be insufficient to photograph this set. We now place light B on the opposite side of the set. This will not only kill the shadows from light A but will act as the highlight for all objects on the right side of the set and our first light, A, will kill the

shadows of light B and act as a highlight for all objects on the left side of the set. With limited lighting facilities of this kind it might not be well to diffuse either of these lights as you undoubtedly will need all the light they give to secure a proper exposure. Also this is not a set-up that would permit the camera to take in a full picture. By this we mean you would have to confine your shot to a three-quarter picture.

Reduced to its simplest terms, that is the A and B of lighting. The C of lighting will consist of the backlighting of the scene. Obviously on a set like this it will be impossible to place a light back of the furniture or people who might occupy the scene without having it glare right into the lens, or if placed low it will not include the entire picture. So this third light will have to be placed high out of the lens angle approximately at a point that will hit the front edge of the radio. You will note this is outlined with dotted lines on the radio, this is to indicate that it is above the radio. This light must face directly down. While it will flood the entire set and light the back wall, throwing light behind the chairs and radio to mould those pieces, still its greatest light is being poured to rear of the set and will act as a back light, lighting the hair of the people who might be occupying the chair and the couch.

The placing of this light might be a bit of a problem. Obviously there is nothing to hang it on. You cannot use a stand lamp, as the stand would show in the picture. This might be overcome by stretching a wire across from the picture moulding, or if there are windows on each side, a wire from one window to the other and hang this light from that wire, making sure, of course, that it is not in the camera angle.

If you will recall last month's article on the lighting of the human face you will remember that this lighting of the set is not dissimilar. In that set-up a light was placed to the right of the person, another to the left a bit farther away and one for back lighting. The second light placed at a little greater distance was set so as not to kill the shadow entirely, but to give a nice balance over the first and predominating light. It was also suggested that it be diffused.

However, in the lighting of this set, in view of the fact, that a greater area is covered and more people will be involved, it will readily be understood that the lights as placed will act as highlights on those things nearest to them and tend to kill the shadows on those at the greatest distance from them.

The third unit is very important for back-lighting. This, however, will be influenced by the color of the walls. If they are light they may tend to act as reflectors and furnish sufficient backlight of themselves. However, for the one doing his first job of lighting it would be well for him to experiment both ways.

As we said, we have not attempted to bring out any artistic effects. We have not attempted to do any moulding of objects or furnishings, but have merely set down here the simple basis of lighting for a set presumably in a home.

The studio naturally is built and equipped to handle these situations in the very minutest details. Special lamps and special equipment for lamps are available. These would be prohibitive in most cases to the amateur, however, there are a few items that he might build economically which we will endeavor to explain to him in succeeding articles on lighting the set. The first and most important thing in your first step of lighting is to get sufficient light, next to work away from flat lighting and to cross your lights so

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Shooting Close-Ups Indian Style

by
Karl Hale

A MIGHTY interesting story is told us by Stanley Foster, cinephotographer, who uses a 16mm camera instead of a rifle when hunting:

For years Foster had been an enthusiastic huntsman, traveling into the forests of Canada from his home in Adrian, Michigan, to bag big game. He is still an enthusiast of the hunt, but the 16mm camera has brought a new type of hunting to him and he now brings his prey home on the motion picture film to enjoy his jaunts into the wilds any time he wishes. However, we believe the most interesting part of the yarn he tells is the tip the Chippewa Indians gave him in how to secure scenes of the wily moose.

It was only by exercising a great deal of patience that he secured the information from the Indians, and when he had the information he wanted it was also only by exercising the greatest patience that he secured the pictures he wanted.

Seemingly, the Indian is not a talkative sort of chap, but once he feels friendly toward you he will give you some very valuable information in hunting lore.

Foster wanted a good picture of a moose; in fact, he wanted a good continuity of one of these big fellows. By observation he found that they fed mostly near the shore in the shallow water, but this didn't do him a great deal of good, as he found on several experiments that they swished away even though he was perfectly concealed on shore behind shrubbery.

Frequently the moose wade out into the water until just their heads protrude above the surface, and then reach down in the water feeding on weeds at the bottom. They seem to be able to keep their heads under water much longer than any other of the upland animals. The Indian plan of approaching the moose is first to see that the wind is blowing from the moose to the photographer and then, as the moose in the distance places his head underneath the water to feed, the canoeist paddles as rapidly as he can toward the unsuspecting moose. As soon as it is apparent the moose is coming to the surface, the hunter becomes rigid in the canoe, leaving the paddles in just whatever position they may be at that instant. Even though the canoe continues forward in the water the moose does not seem to mind or possess the ability to distinguish a man in the canoe unless he makes some motion. So as soon as the moose again puts his head underneath the water you again paddle as rapidly as possible and then remain motionless as the head of the moose is seen above the surface of the water.

This operation is repeated again and again until you are only a few rods away from the moose. Then as he puts his head beneath the water for the last time, you either paddle very rapidly or else pull the rope on the motor, if one is attached to the canoe, and run the canoe between the shore and the moose. The moose is very much alarmed on finding a canoe so near and takes to the deeper water. If you are handy with the paddle or have an outboard motor you will have no difficulty in securing all the movies you may desire. Time and again by this method Foster was successful in approaching moose and securing many good close-ups.

The camera method of hunting is more difficult than with the rifle, according to Foster. One must not only keep up wind from his prey, but he must be in photographic distance, and then above all there is the light to take into consideration, an important point in photography, but of no value in hunting with the rifle. The direction of the sun is, of course, doubly important when you are photographing on the water, so Foster seemingly has added more hazard to his method of hunting than the type he has forsaken.

But his moose pictures are said to be worth while. Fine close-ups of his head, a medium shot of him sailing through the water and a long shot of him, all combining to make a fine piece of hunting continuity that will never go out of style.

Foster didn't bring any trophies home with him on his running beard, but he did secure several rolls of the finest hunting pictures that he has had the pleasure of taking. He has a permanent record of a hunting trip that he can live over any time he desires.

Let's Make A Locomotion Picture

by

Henry Sharp, A.S.C.



SUPPOSE you are a traveler why not a reel on Rail-roads of the World? It can easily be a by-product of your regular travel films—merely an extra shot or two on each roll, but it can be edited into one of the most unusual (and interesting) films in your library.

It doesn't matter in the least where you go—whether you take a round-the-world Cook's Tour, or confine yourself to a short jaunt in your own country, wherever you go, you are sure to find interesting material, even in the rail-road-yards of your home town, you can find a dozen little details worth filming. Let's suppose, for the moment, though, that you are one of the lucky folks who is going abroad. What can you plan to add to your railway reel?

The first—and most obvious—idea is to make a reel comparing foreign and domestic railway methods and equipment. On the one hand, you have the massive engines of American roads, designed for long, hard runs, and heavy loads; on the other hand, you have the neat, light, and beautifully-finished European engines, designed for short runs at high speeds, pulling light trains. There is an interesting contrast in itself—a contrast which can be brought out all the more forcefully by careful camerawork. Imagine, for instance, a sequence built around "The Overland Limited," "The Orient," or the "Twentieth Century", starting with some shots of the train leaving one of the terminal stations, you could carry it through its run with a series of pictorial shots of it rocketing along the level stretches, or climbing ponderously over the Rockies. Then you could bring it to its destination, and end with shots of the engine, with the engineer carefully coing up after the run. The keynote of all of this should be massiveness—the majestic proportions of the mountain-locomos—low camera-angles for the close-shots, low viewpoints for the long-shots, everything planned to accentuate the thoughts of mass and magnificence.

To contrast with this, imagine a companion-sequence of such a train as "The Royal Scot" for its daytime companion, "The Flying Scotsman" in its run from London to Edinburgh. This train is much smaller and lighter than any American trains, so your keynote should be lightness and agility. Higher camera positions, of course, lightings and fittings that depict the train in a lighter tone; and pictorial shots of the famous train scampering along through the pretty valleys of the Midland Counties.

Or, suppose that you would like to show the differences in construction between foreign and American lines: what a wealth of subject material you have here! Even though the basic principles are the same, the application is different:

the very track is laid differently, the coupling devices connecting the cars are different, many European freight (or "goods") trains, even, do not have air-brakes. No European engine boasts a bell—and the whistles are usually a joke. The headlights are different; in England, for instance, by the number and arrangement of the headlamps (or, by day, flags, and similar indicators) you can tell whether the train is a passenger, "goods," or mail-train, whether it is a regular or a special, or even when it is merely a string of empty "waggons." Here in America, the engineer usually sits on the right-hand side of the cab, in England, he is on the left. And, too, many of the European trains offer unusually interesting opportunities for Kodachrome workers, trains and engines are often painted in bright colors, such as blue, green, and maroon.

Then, for him who has the time and the interest, there is yet another interesting phase, collecting films of trans-continental novelties. Some of our smaller lines here offer much in this respect, in Europe there are, of course, such unusual subjects as the bifurcated monorail at Ballyvaughan, Ireland, in which the train runs on an A-shaped track, with a complete assembly of boiler, cab, cars, etc., on either side, and the Barmen-Elberfeld suspended monorail, in Germany, which straddles streets, river, etc. Then, too, there are the merry rack or cogwheel mountain railroads in Switzerland (such as the Rigi and Pilatus roads) and, of course, their equivalents in America, climbing Pike's Peak and Mt. Washington. Then, there is the train-ferry, "Drottning Viktoria," which carries the whole train, engines and all, on the Malmo-Helsingborg run across the Baltic, from Trälånged to Sessåra.

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HERETOFORE 16mm cinematographers have been limited to reproducing their microscopic subjects in monochrome, with the result that many subjects so filmed lose much of their real value.

The amateur has at his disposal one of the best color methods available, requiring but little technical knowledge to reproduce colors in a truly accurate and lifelike manner. The application of this process to cinematography opens to him not only the beauty of form and rhythm, but of color as well. Apparently the amateur experiences difficulty in combining the optical principles concerned.

It is not the purpose of this article to go into all of the technical phases of photomicrography, or to describe the optical principles involved in the Kodacolor process. This information is available from other sources, if not already known by the amateur.

There are two methods by which the Kodacolor process might be applied to cinematography. One method requires special optical equipment for projecting the image directly on the film. This optical equipment is not available to the average amateur. The other method herein described, is quite simple and inexpensive requiring little knowledge of optics or photography.

The entire set-up consists of seven units, i.e. (a) a laboratory microscope, (b) a Kodacolor equipped cine camera, (c) carbon arc and water cell, (d) photographic ground glass, (e) an auxiliary lens of approximately 3 inch focal length, (f) a suitable support for these units.

The microscope is placed upon a solid platform and above it is mounted the cine camera. The optical systems of the two instruments are centered as near as possible by inspection. Above the microscope eyepiece and approximately seven inches below the camera lens, is mounted the ground glass screen (d).

The illuminating system consists of a carbon arc so adjusted as to throw a beam of light through a water cell to the microscope sub-stage mirror, which in turn directs this beam up through the lens system of the scope and produces an image of the object on the ground glass. The water cell is filled with distilled water which removes most of the heat from the light and prevents damage to lenses and preparations. Due to the fact that an optical bench, in the usual sense of the word, is not used in this set-up, it is necessary to place a thin ground glass disk, usually supplied with the microscope, in the holder provided below the sub-stage condenser. This disk diffuses the light sufficiently to assure even illumination throughout the entire microscopic field.

The ground glass screen (d) is an ordinary 5x7 ground glass which can be obtained from any photographic dealer. To a large extent the quality of the image to be photographed depends upon this screen, as its function is to pick up the image projected by the objective and eyepiece lenses of the microscope. In order to pick up this aerial image it must diffuse the light to a high degree. This diffusion is necessarily accomplished by the individual grains of the



Symbols in this sketch are explained in text

Experimenting

screen surface. Naturally this diffusion destroys much of the fine detail within the projected image and it is certain that this detail, the essential component of all photomicrography, once destroyed cannot be restored by the camera lens and film emulsion. To be more precise, the problem of detail is one of resolving power. The criteria of such work is to resolve as fine detail as possible, being limited only by the resolving ability of the microscope's optical system and the film emulsion itself. In addition to this problem is the one of illumination. This is more apparent when one realizes that the Kodacolor filter has an exposure factor of approximately 35X and this factor is extremely evident in any attempt to make Kodacolor movies by artificial light.

These problems, ground glass grain size and the light absorbed by it, can be met in two ways, first, by a reduction in grain size or second, by doing away with the ground glass entirely. As previously stated, the latter method can be done, but requires optical equipment not within the range of the average amateur. The author has met this problem by the simple expedient of treating the ground glass screen with ordinary mineral oil and wiping the surface almost dry. This treatment tends to fill up the spaces between the individual grains and effects a reduction in diffusing ability, as well as increasing to a great extent the amount of light transmitted by the screen. However, there seems to be a limit as to the amount of oil that should remain after wiping. Too much tends to destroy the image completely by making the grains non-existent, too little tends to destroy detail and increases light absorption. The exact amount

that should remain can be determined only by experiment. To further overcome the effect of grain, the author has devised a mechanism that utilizes a principle not previously applied in cinemicrography. By electrically vibrating this screen at 50 cycles per second the image of an individual grain is blurred to such an extent that it becomes non-existent so far as the film emulsion is concerned. Excellent Kodacolor cinemicrographs can be made however without this expedient where high resolving power is not of paramount importance.

It is important that this screen be mounted upon a parallel plane with the microscope stage, otherwise the projected image will be distorted and it will be impossible to properly focus the entire image. It is also important that this screen be mounted independently of the camera or microscope assembly, particularly when using the vibrating screen principle or stop-motion equipment.

Focusing of the image on the screen is accomplished by the coarse and fine adjustment of the microscope. The screen should be placed close enough to the eyepiece of the

scope that the projected image be not more than three inches in diameter. If the amateur finds that the ocular absorbs too much light it may be removed with the subsequent loss of its corrective properties which will not seriously impair the results in low power work. This, however, is not recommended.

At this point in the procedure it is necessary to focus this image upon the film. This step is facilitated by having the back of the camera film gate sewed out to full frame size and placing in the gate a piece of matte film. (Matte surface away from camera lens.) A dental mouth mirror aids in viewing this image. (See Fig. 2.) In order to have this small image sharply in focus and completely fill the motion picture frame, it will be necessary to set the camera lens midway between two feet and infinity and adjust the auxiliary lens (al up or down for a coarse adjustment. A fine adjustment is made by manipulating the camera's focusing lens mount. When these adjustments have been made the image as it appears on the matte film must be sharply defined and evenly illuminated. The matte film is then carefully removed and the camera loaded with Kodacolor film.

Correction of the color filter for the light source used, to give a correct color rendition, is accomplished by rebalancing portions of the Kodacolor ratio diaphragm. It is best to use the old type K diaphragm and reverse it on the filter mount so that the original red portion now covers the blue segment of the filter. Most carbon arcs are too rich in red and if the ratio diaphragm as now placed still passes too much red it can be further blocked with lantern slide binding tape. The amount of this correction can only be determined by experiment, as each type of carbon inherently possesses different relative values of excitation of the three primary colors. The average carbon arc of from 15 to 20 amps. will make excellent color movies when using the new supersensitive Kodacolor film. In photographing deeply stained preparations or those which are quite dense and present a predominance of red, it may be necessary to operate the camera at half speed or increase the light intensity.

Visual focusing of the image during exposure is controlled simply by observing the image on the ground glass. This focusing is done with the coarse and fine adjustments of the microscope.

Beautiful cinemicrographs have been made with this setup of pathological tissue sections. When used in conjunction with the stop-motion device previously reported,² beautiful studies of crystal growth have been recorded.

Those amateurs fortunate enough to possess special photomicrographic equipment such as an optical bench, automatic arcs, apochromatic objectives and compensating eyepieces, polarizers, etc., will find a new medium to use in their studies. Those amateurs having but an ordinary microscope and meager accessories, will have found a new combination to appeal to his scientific and esthetic sense.

With Kodacolor Cinemicrography

by

Alan C. Woolley
Cinematographer

Showing use of dental mirror for focusing



²The American Cinematographer Vol. 15, No. 10, Feb. 1933

Many Among Honorable Mention Almost In Medal Class

News of Contests Conducted in Other Parts of World and Results of Los Angeles Cine Club Competition

In some instances it was by the proverbial "hairbreadth" that those who were given medals were not outpointed by some of those included in the Honorable Mention class of the American Cinematographer 1933 Amateur Competition.

"Ciliary Action" by Arthur Preetz, M.D. of St. Louis, Mo.; "Bermuda the Land of Sunshine and Flowers" by Konstantin J. Koschik of Long Island City, N.Y. and "Mr. Motor Boat's Last Stand" by John A. Flory of New York City were among those which worried the judges in their decision.

Others selected for Honorable Mention by the committee appointed by the American Society of Cinematographers include A. C. Baister, M.D., Springfield, Ill., for his two-reel picture "Milk, Its Production and Pasteurization"; R. P. Ewing, Caracas, Venezuela, South America, for his one-reel picture "Red Sand"; Edward J. Hayes, Orange, N.J., for his one-reel production "Hansel and Gretel"; Lieut. A. J. Holm, San Francisco, Calif., for "The Quest of the Phantom"; one reel, Vincente Milla, Manila, Philippines, for "Filipino Flagellants"; one reel, E. C. Rosenberg, Oakland, Calif., for "Yosemite Nature Notes"; one reel, M. F. Sissel, Austin, Minn., for "Vacation Reflections"; one reel, K. G. Stephens, San Francisco, Calif., for "Beauty Sports"; one reel, E. Yeagle, Baltimore, Md., for "Spinal Anesthesia"; two reels, E. G. Thompson, Oakland, Calif. for "Ry-Lock"; one reel, Charles A. Gromet, Brooklyn, N. Y., for "Microscopes"; one reel, and Elton Fox, Oakland, Calif., for "Waterways"; one reel.

Each of the pictures entered in the contest were given a review and criticism by one of the members of the judging committee which was sent to the entrant. This reviewing service, of course, is not confined to the contest pictures, but is given to those who send their pictures to The American Cinematographer throughout the year.

British Contest

Great Britain also had a very successful competition conducted by the Institute of Amateur Cinematographers. This is the representative organization of amateurs in that country and includes in its membership many of the royalty of England.

At a banquet given at the Mayfair Hotel which was attended by motion picture stars and presided over by His Grace the Duke of Sutherland, K.T., president of the Institute, the prizes for their 1933 competition were awarded.

In Class A the prize was offered for the best Film of Holiday, Trip, Cruise or Aeroplane Flight and was won by M. L. Nathan for his picture "An Austrian Village."

Class C covered the Best General Interest Film and was won by Miss Ruth Stuart Rodgers with her film entitled "Egypt and Back with Imperial Airways." This film was also given the gold medal in the American Cinematographer competition this year in the Travel Film class. In this class a second prize was offered by the Institute and went to M. L. Nathan for his film "Westminster in Winter."

Class D governed the Best Abstract Film. The prize under this classification went to James A. Sherlock for his picture "I Bequeath."

Class E covered the Best Family Interest Film and was awarded to J. B. S. Thubron for his film entitled "Her Second Birthday."

Class G was given over to Color Film. The prize under this classification was awarded to Dr. Makamillan Papp of Jugoslavia for his film entitled "Nature in Colours."

Class I included the Best of the Prize Winning Entries. This prize consisted of the International Challenge Trophy, open to the world. It was won jointly by Miss Ruth Stuart Rodger with her film "Egypt and Back With Imperial Airways" and M. L. Nathan with his film "An Austrian Village."

Holland Contest

In Holland the Cine Amateur Club idea has grown rapidly. According to the latest figures from that country the Nederlandse Smalfilms club numbers approximately 400.

D. Kneft, former secretary of that organization, reports that the 1933 contest was a big success. The work in the 16mm. documentary class was exceptionally fine. In this class Mr. A. Carre of Rotterdam won the first prize with his picture "Kluisenschol."

In the Scenario class the league experimented with the entrants making a picture from a scenario recommended by the league. This experiment did not prove highly successful.

In the 9.5 mm. class the outstanding film was submitted by Mr. Clement. This was titled "Phantasy," built around soap bubbles and smoke.

The information coming from this club was very meager, but seemingly they were concentrating their efforts toward

the contest which was held in Paris this year.

Paris Contest

A special cable dispatch from Paris on the outcome of their 1933 contest brought only the skeleton facts on the awards given. These merely designated the country in which the winner lived and did not give details as to name of entrant or name of winning picture. The first prize was won by Japan, second by France and the third by a United States competitor.

Spain: His Spring Contest

The contest to be held by the Amateurs of Spain with headquarters in Barcelona will close on March 5th, 1934. This contest will be wide in its scope and broad in its recognition and will have among its classifications cultural, scientific, pedagogic, excursions and travels, folklore, news, sports, industry technique and general documents as well as scenario pictures.

L.A. Cine Club Evening

Selecting three pictures each from three consecutive meetings, making a total of 9 pictures to be played in competition for prizes ranging from first to ninth, the Los Angeles Cine Club turned their final selection over to the American Cinematographer to judge according to the methods and standards set down in the annual contest.

The final decision of the judges gave First Prize to R. B. Clardy for "Carille Country"; the 8 mm. picture which ranked so high in the American Cinematographer contest; Second Prize to E. W. Walker for his scenic "High Sierra"; Third Prize to W. J. Seaman for "Prairie Schooner" which took the silver medal in the American Cinematographer contest for "Home Movie"; Fourth Prize to Harrison Chandler for "Esenada"; Fifth Prize to Wayne Fisher for "Echo Lake"; Sixth Prize to F. B. Skeels for "Pine Cones"; Seventh Prize to Fred Chomson for "National Air Races"; Eighth Prize to C. E. Memory for "One Day" and Ninth Prize to R. F. Oden for his 8 mm. picture "Sea of Silence."

Coles Win In New York

Charles and Robert Coles with their Cinecoles Revue were the winners of the prize offered by the Metropolitan Motion Picture Club. This picture is of the news reel type. "Mexico" by Sidney Moritz was given honorary mention.

John Arnold, A.S.C., Busy

In addition to his duties as President of the A.S.C. and head of Metro-Goldwyn-Meyer's photographic department, John Arnold found that Christmas nearly doubled his work. It seems that most of MGM's many stars found 16mm. cameras in their Christmas stockings—and John is now hard at it showing the noted novices how to make movies.

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The basic model of the Special is equipped with a Kodak Anastigmat $f.1.9$ lens, double lens turret, one 100-foot film chamber, set of six masks. Price and estimates on adaptations to fit specific needs given on request. Write for the Ciné-Kodak Special Book.



DOUBLE EXPOSURE

The first exposure, of the man, is filmed with concentrated lighting against a dark background. Then, the film is wound back and a second exposure made, of the girl.



HALF MASKING

The scene is "shot" with a horizontal half mask blocking off the upper half of the image. The film is wound back, the other half mask used, and the scene shot filmed.



ANIMATION

The cardboard hand mask or single frame button can be used for making animation. Half masking or double exposures make animation especially interesting.

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Let's Make a Locomotion-Picture

(Continued from Page 267)

The essential thing, of course, in making such a reel, is to decide what aspect of the subject you want your picture to tell about, then concentrate on it. You can tell a great deal simply by your photographic treatment. For putting over the idea of massiveness, for instance, low camera-angles are the best—often angle shots, with the lower part of the picture well filled by the dark mass of the engine. For portraying the lighter, faster European trains, more straightforward treatment is more satisfactory—usually with either a front-light or a cross-light, to eliminate heavy shadows from the foreground.

If you want to film the trains in motion, a three-quarters front angle is the most satisfactory. In the mountains, a viewpoint where you can show the train crawling around curves is always good—and curves (especially S-curves) are extremely pictorial. When you show a train in motion, it is always better to show some smoke coming from the funnel, this is most frequently found when the train is ascending a grade, when the exhaust steam rushes through the stack in great puffs, and billows out in huge, white clouds. For these shots, use a filter! A fairly heavy one, of course, with regular Pan, a "Q" will give about the right effect, or, with Supermotive, an "F." If you can, choose a day when the sky is really blue, so your filter will darken it, and give the smoke an effective background. And, if you want to, you can "cheat" to surprisingly good effect, getting night scenes by daylight, use a very heavy filter (for Pan, either an "B" or a 23-A56 combination, for Super-Pan, a 721), and keep your exposure pretty well down. Choose a scene where you can get the train coming along in late afternoon, with a front light, so that the sunlight winks back from the windows and headlights. Then, with your heavy filter, and relatively low exposure you will get the effect of the train, with lighted windows, rearing through the night. If there is white smoke, this will show up against the black sky very effectively. But, try a transposition film! Whether you deliberately plan it, or make it as a by-product, you'll find it will—properly made and sold—be one of the most popular films in your library, and it's mighty interesting to make!

MCM After Milner

• With Ernst Lubitsch signed to direct *The Merry Widow* for MCM, Victor Milner, A.S.C., Lubitsch's inevitable teammate, is being sought to preside at the cameras. Under contract to Paramount, Milner is trying to find time between Paramount assignments to make the *Widow*.

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AMERICAN CINEMATOPHILE
 6331 Hollywood Blvd. Hollywood, Calif

Winning With An 8mm

(Continued from Page 362)

All of the titles used were large and were photographed from a distance of six feet. The introductory title and cast of characters I was able to letter in poster paint, white and gray, on a black background. The sub-titles were set up with cast letters, three-quarters inch high, in white, upper and lower case, also obtained at a sign painter's supply house. These were placed on a cloth covered background, slanted at an angle by propping one end on a box on the ground, outside in direct sunlight. The camera was used on a high tripod, made solid by a suspended weight. A slanting light struck the letters, throwing a slight shadow on a medium dark background. The titles were few and brief. A western hat and coiled rope were placed halfway into the picture at lower left and a pair of spurs at upper right, also only partly showing. These were kept in a low key to prevent distracting attention. With good sunlight, stop "F-11" was very successful and rendered the titles sharp.

To have my first attempt at a film story prove so successful in competition has a tendency to spur me to attempt bigger and better things (in 8mm), and it goes without saying that my A.S.C. Gold Medal and my "first" in the Los Angeles Cine Club are the big things in life for this particular amateur cameraman.

A B C of Set Lighting

(Continued from Page 365)

us to have one side more brilliantly lit than the other and then to have back lighting.

Study the set you are to light, experiment with your lights before shooting and endeavor to study the effect of these lights so that your eye will become accustomed to balances. We have not touched upon this, as we believe you must first learn how to lay the foundation, but as you go on you will realize how the placing of the lamp in different positions and different distances will give you pleasing effects. You will work out its lighting value that will possibly be something a part of yourself. Attempting to imitate the lighting of another photographer is not always successful, as you do not have the same "feel."

Dr. Dieterich, A.S.C., Returns

Dr. L. M. Dieterich, A.S.C., who has been in the east for some time, has returned to Hollywood. He will continue as a consulting optical engineer for the film industry here.

Coincidence?

With Mae West playing a lion-tamer in her latest film, Hollywood is wondering if it's only a coincidence that the picture was photographed by LEO TOWER, A.S.C.

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HERE'S HOW

FILTERING SNOW-SCENES. "I am greatly indebted to you for your splendid interest in my problems. Your advice has helped me 100 per cent in getting the results I desired. Now, will you please be so kind as to tell me what filter you would suggest for winter landscapes and snow-scenes, with Super-sensitive film?"—A.W.K. Yankers, N. Y.

The question of which filter to use for snow-scenes depends a great deal upon what effects you want to get. If, for instance, you want a definite separation between the snow and the sky, you'll do well to use an Aero 2 or a "G" for even a deeper filter, such as the 25-A or an "F," if you want an overcorrected, dark sky. If, on the other hand, you don't care so much for the color separation, but want merely to kill the glare and halation from the snow, a Neutral Density filter would be the thing—preferably the 25 ND. And if you want some color correction, combined with a reduction of the glare, use a 5-N-5, which is a combination of an Aero 2 and a Neutral Density Filter.

—Milton R. Kravner, A.S.C.

THE "LATHAM LOOPS." "What is the "Latham Loop," and what is its purpose?"

—S.V.A., Los Angeles, Cal.

The "Latham Loops" can be found in any motion picture camera—they are one of the very foundations of the process. Open any cinema camera or projector and you will see that the film comes in from the magazine or reel, passes over a sprocket, then makes a loop before going through the intermittent, and past the photographing aperture. It then makes another loop before passing under the sprocket, and out. These two loops are the "Latham Loops", their actual form varies according to the design of the camera, and ranges from the complete circle of the DeBrie and Askani cameras to the loose U-curve commonly seen in American apparatus. The purpose of these loops is to allow the film to pass the aperture with an intermittent movement, unaffected by the continuous movement of the feed and take-up, and, recently, of the sound-on-film recording and reproducing apparatus. Until a truly successful non-intermittent camera is perfected, it can be accepted as axiomatic that no motion picture camera or projector can operate successfully without these loops. This is so basic that it was

one of the cornerstones of the power of the old Motion Picture Patents Co.—the "Film Trust" of twenty years ago. The principle of the loop was patented about 1894 by Otway and Gray Latham and assigned to the Patents Co., and the mere fact that a camera or projector used them proved unless the machine was one of the few types made under the "Trust's" license that the machine, its maker and its operator were infringing the "Trust's" patents. A large corps of detectives harried all independent producers and cameramen, often smashing the offending cameras, and always trying to ruin the exposed film. For years, no independent cameramen would let anyone—even his closest friends—use the inside of his camera; and frequently, the camera would often be loaded in the studio's hidden darkroom, smuggled out for the day's work, and back again at night. The power of the trust was broken, after many years of litigation, by a Supreme Court verdict rendered in 1916, but motion picture cameras and projectors still use the "Latham Loops."

—Gaetano Gaudio, A.S.C.

FILM PRESERVATIVE. "What should I use in my humidifier-rins to keep my 16mm. film in the best condition?"—A.G.L., Chicago.

An excellent formula is:

Water	100 cc.
Glycerine	2 grams
Oil Eucalyptus	2 grams
Spirit Camphor	2 grams

All of the chemicals should be 2 percent solutions. When mixed, this preservative may be used to moisten the pads in humidifier-rins, and will keep the film in excellent condition.

—Jackson J. Rose, A.S.C.

REFLECTORS. Why are reflectors with gold paper used instead of the silver kind? Is this because panchromatic stock is being used?

A.R.I., New York City.

● Gold leaf reflectors are very effectively used in connection with panchromatic film. These reflectors absorb a great deal of the blue and violet radiation of the sunlight and thus the reflected light is more appropriate for good chromatic conditions. Charles Clarke, A.S.C., in a recent article in this publication, explained reflectors and touched very clearly on this type of reflector.

CLYDE DEVINNA, A.S.C.

CEMENT FOR ACETATE FILM

"Is it possible to make your own cement for splicing 16mm. 'safety' film? If so, how is it made?"

—E.H.E., Philadelphia.

In view of the fact that excellent cement for splicing acetate (Safety) film is commercially available at very small cost, it is hardly practical to make your own, but if you want to experiment, here is a very satisfactory formula:

Gelatine	5 grams
Acetic Acid (Glacial)	50 ccm
Water	10 ccm
Methyl Alcohol	500 ccm
Acetone	500 ccm

—Andre Barlaet, A.S.C.

MORE ABOUT FILTERS.

"You will recall that some few months ago wrote an article in the *American Cinematographer* re the use of filters... covering the K-3, G, 21, 23-A, 25-A, 29-F, and 56-B. I have obtained these filters, and have used them as suggested in your article, but I must confess that I have not been able to get the correct factors, though I used those you gave. The film has been *Peruete Fine Grain Ortho* (negative), *Agfa Ortho Negative*, and *Agfa Novopan*. In the former, all the results have been underexposed; in the latter film, which is about 1200 H. & D., the result has been over-correction. Will you please help me with the proper factors for these filters for use with *Negative Ortho*, and also for *Pan and Super-Pan*?"

—W.C., England.

Your difficulty is simply that you have been using the filters on the wrong emulsions—emulsions to which they are not adapted. Orthochromatic emulsions are sensitized quite strongly to the blue, slightly to yellow and are almost entirely blind to green and red. Now, the filters from the "G" on, cut out more and more of the blues and yellows; and when these are gone (or even reduced), you've nothing left to make an exposure on Ortho. On *Pan* and *Super-Pan*, on the other hand, you have an emulsion which is sensitive to red and green, therefore, you cannot only get an exposure, but secure the color-correction you want.

The answer, therefore, is this: If you want to use these filters, use either *Pan-chromatic* or *Super-Pan* emulsions; if you want to use Ortho film, don't use any filters except the K-1, K-2, and K-3, which were originally intended for use with Ortho. Personally, I am inclined to restrict even this list somewhat, as the K-2 and K-3 are rather too heavy, and produce an overconnected effect, when I used Ortho, I found the K-1 sufficient for most normal work, with Ortho film this has a factor of 3 or 4, while with *Super-Pan*, the same filter has a factor of 1½. The following table gives the

factors for your filters with *Pan* and *Super-Pan* films:

Filter	with <i>Pan</i>	with <i>Super-Pan</i>
K-3	4	2½
G	5	3
21	4½	2½
23-A	6	3
25-A	10	4
29-F	16	8
56-B	8	4½

As to your experience with *Agfa's* "Novopan," we can give you little help, since that film is not available in this country. I would suggest that you take the matter up with *Agfa's* head office, in Berlin.—Wm. Stoll, A.S.C.

Photography of the Month**"LITTLE WOMEN"**

R-K O Production

photographed by Henry Gerrard, A.S.C.

When a famous and well-loved book is brought to the screen, everyone connected with the production is faced with the difficult task of preserving the idealized visualizations of millions of readers. In the production of "Little Women," this has been done with outstanding success, by no means the least of which is that which crowns the efforts of Cinematographer Gerrard. His was the task of capturing the mood of the story in light and shade—of retaining the mood while bringing to life the atmosphere of the Civil War period. To say the least, this was a difficult assignment, the more so since the action ranged over a wide diversity of dramatic moods, while the sets and costumes (historically correct) held innumerable pitfalls and difficulties for the unwary cinematographer. In all this, Gerrard has succeeded most brilliantly, and made "Little Women" one of the most perfectly-photographed productions of this—or any—year. It is technically and artistically of the very highest order: a combination of excellent personal lighting and a sensitive understanding of visual mood, of realism and idealism, which has seldom been approached. Whether you are interested in the science or the art of cinematography, or merely in search of the best in entertainment, see "Little Women."

Real Home Movies for George Barnes, A.S.C.

• Many cinematographers have made home movies for pleasure—but Cinematographer George Barnes, A.S.C., had to do it for business. Mrs. Barnes (Joan Blondell to you) was needed for some retakes—but, as she was convalescing from an appendectomy, her family physician wouldn't let her go to the studio. So Husband George brought the studio to her! Camera, lights and recording equipment were brought to the Barnes home, and the needed scenes were "in the box" within an hour.

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Panorama Pictures With Your Leica

(Continued from Page 352)

tripod head by cockwork. The film is pulled past a narrow slot and exposed as the camera turns. Panorama pictures for the full 360 degrees can be made with this camera. The fourth method is to use a standard camera and to make several exposures of adjacent angles in sequence, thus making a composite panorama. With this method it is also possible to use lenses of different focal lengths and to cover the full 360 degrees. This is the method used to make panorama pictures with a Leica.

It is easy, interesting, and inexpensive. Moreover, it is quicker than might be imagined. I recall some hurriedly made trips to Death Valley, Yosemite, and Mexico when time was at a premium. Yet on all of these trips, I was able to make a number of panorama pictures along with hundreds of other Leica pictures.

For equipment you will need a tripod with a revolving head, a level, and a simple base-plate for the camera. The tripod that I use is of the ordinary Kodak variety. The level I purchased at the dime store. The simple base-plate I had made. It is illustrated in Figure 1. It is a piece of aluminum, drilled with several holes which are threaded to take a tripod screw. This plate, when placed between the camera and the tripod, enables us to mount the camera so that it can rotate on the axis of the lens. The lens diaphragm (approximate gauss point) is directly over the center of the tripod head. The advantage of this will be seen by comparing Figures 2 and 3. A detachable bracket is provided for mounting the camera in a vertical position, if that is preferable, as is sometimes the case when photographing tall subjects.

Figure 2 represents a panorama of six pictures with angles of 30 degrees each. The camera is revolved at the Gauss point of the lens, i.e., where the rays cross. The six pictures match perfectly in all planes, as the angles are adjacent.

Figure 3 shows a panorama composed of three pictures. Each embraces an angle of 30 degrees. The camera was rotated at its focal plane. From the diagram it will be seen that the pictures match only at one point. Also that some planes are not included in any of the three pictures, while other planes overlap. It is obvious that panoramas made in this manner are not wholly satisfactory, unless the panorama includes objects in only one plane.

The procedure followed in making a panorama is simple. With a 50mm lens, it requires nine pictures to make a 360 degree panorama. However I make ten pictures, as this gives a slight overlap in

the pictures which is trimmed away when the prints are mounted. This overlap allows me to place my line of picture at the least conspicuous place, i.e., between two people in a group picture, etc.

Mark off on the revolving tripod head ten equally spaced marks (this will, of course, vary with the focal length of the lens used). Set up the tripod and level it so that the horizontal plane of the camera is level throughout the full swing of 360 degrees. This is imperative. Figures 4 and 5 illustrate how this is accomplished. First level the camera as shown in Figure 4 and then swing the camera and level it as shown in Figure 5. The camera will then be level for the full 360 degree swing.

The camera is now attached to the tripod with the aid of the base plate, so that the diaphragm or iris of whatever lens used is directly over the center of the tripod.

To make the panorama expose the pictures step by step, in sequence and with the camera advanced each step in a clockwise direction, it is advisable to do this as quickly as possible, so as to prevent any light change or cloud movement. Should the panorama be exposed in a counter clockwise manner, the prints will need transposing. Also you will not be able to tell the effect of your panorama upon viewing the negative, as it will resemble a jigsaw puzzle.

In conclusion, let me add the few following notes. In making your prints for the panorama, contact or enlargements, be sure that each print in the panorama has the same exposure and development.

In living up for a panorama picture, it is sometimes advantageous to slightly tilt up or down. This can be done if you use a tilt head similar to those used for 16mm cameras. A Meyer universal tripod head can also be used. One word of caution. The horizontal plane of the camera must remain level at all times.

The most satisfactory panoramas are those containing from three to five exposures. More than this becomes cumbersome. The pictures may be mounted as a whole or made so that they will fold up like a set of postcards.

Panorama pictures may also be made with miniature cameras other than the Leica, by adhering to the above directions closely as possible.

Again the miniature camera has demonstrated its wide flexibility. I know that you will be as enthusiastic as I, over the results of this most versatile camera.

A WINTER PASTIME

There is no closed season for the miniature camera. So if you really want a winter pastime for those long Sunday

afternoons, why not start making a collection of snowflake photographs. You might add some of Jack Frost's traceries to the collection also.

Did you ever examine closely some of those fairy snowflakes as they catch on your clothing on their way to the ground? Did you ever find two alike? There are enough beautiful formations to make a crystallographer's heart pound with joy.

It is easy to photograph snowflakes, using a Leica and one of the copying attachments. The whole outfit is so small that it can be protected from the elements by a large umbrella. So the next time that mother nature starts her arctic display, set up the old umbrella over a bridge table out in the back-yard and call that your studio.

I would suggest the following equipment. A Leica camera equipped with an Auxiliary Reproduction Device (ratio 1:1), this is very small and convenient; a piece of glass about 8 x 10 to serve as the stage for the snowflake, and a couple of concave makeup mirrors, that you can get at the drugstore. These mirrors are for collecting and concentrating the weak light on the snowflake. The piece of glass will permit the snowflake to be partially illuminated from beneath. Use the black velvet several inches below the glass as a background.

These snowflake pictures can be enlarged and toned blue. If you have a room that you are trying to decorate, try putting a border of snowflake designs around it. If you are a batik enthusiast, here is the start of a wonderful collection of patterns. Try it, and see if you don't enjoy this winter sport.

Motion and Time Study

While intended primarily as a manual for factory managers and efficiency analysts, "Motion and Time Study" none the less has considerable interest to individuals and firms applying cinematography to practical business uses.

Several chapters, contributed by methods engineers connected with such firms as General Motors, General Electric, Lehn and Fink, etc., give an indication of the business value of cinematographic motion-study records, and their practical application. More important, however, is Morgenson's closing chapter, in which he gives an excellent resume of the practical methods of applying the 16mm camera to these business studies. Though brief, his outline of the principles and practice of Industrial Cinematography is well-rounded and authoritative. His description of the more outstanding equipment available is excellent and impartial. The book is well worth the while of anyone interested in the uses of motion pictures in industrial work. This book was edited by Allen H. Morgenson and published by McGraw-Hill Book Co.

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WORLD'S FINEST 16mm MOTION PICTURE EQUIPMENT

The "Language of Line" In Photography

(Continued from Page 354)

A picture composed entirely of curved lines is generally inclined to be weak and flabby.

The "S" curve, perhaps the most beautiful of the curved lines, incorporates grace, elegance, and perfect balance. It is sometimes called " Hogarth's line of beauty," and is particularly useful in leading the eye easily into the distance.

The "O" circle shows completeness. It is almost too perfect, too mechanical, and is rarely useful in good composition.

Oblique lines furnish us with a powerful tool with which to express energy, action, motion, joy. In the other illustration, note how the oblique lines of the ground, wheelbarrow, arms, legs and body speak so vigorously of action and power.

The zig-zag line is the line of violence, threat, treachery, weakness, and horror. A vivid example in nature is the jagged line of chain-lightning.

Where we have lines, we must have angles; acute angles convey ideas of energy and action; right angles are harsh and cold, and because of their mechanical nature should be used sparingly. Oblique angles suggest restful ease and harmony.

The triangle gives firmness and physical stability to the picture. It has been frequently used, from the Old Masters down to the present time, but it should always be employed in conjunction with interesting curved lines and masses.

It must be borne in mind, however, that when one refers to lines, angles, and geometrical figures such as circles and triangles, the reference need not, by any means, be to the actual lines shown in the picture, but to the basic lines and forms suggested by the actual lines, and the arrangement of the elementary masses of light and shade in the picture. Furthermore, a picture is more often a deft combination of a number of these basic forms than it is a single one of them. However, there will almost inevitably be some such line or lines which will predominate, from this, largely, we get the emotional key of the picture.

But all of this, you object, seems terribly far from the realities of present-day cinematography, the art-directors design our sets, and nature designs our locations, we must photograph them "as is," regardless of whether or not the predominant lines are in accord with the emotional effect we wish to convey. True enough, in some cases the cinematographer is helpless; but rarely so. In the first place, most art-directors have been trained themselves in this language of lines—and nature herself speaks it. Moreover, even when this is not the case,

we have at hand a powerful tool capable of making alterations in any set ever built. That tool is **light**. It is part of our business to know that light, properly utilized, will alter faces, and give depth and roundness to sets and furnishings. And, in a picture, what are these but combinations of lines and masses? If we can remake these with our lightings, so, too, can we remake the lines and masses of the rest of the picture. A little study will always show us the lines which, properly accented, will give us the composition we wish, then we can light our set accordingly, subduing the residue with shadows. If, for instance, we are photographing in front of a church, we can arrange our lights so that the vertical lines of the walls and columns are emphasized—not so that, instead, the horizontal lines of the steps, verandah, and cornice will be predominant. In other words, we can compose with light, highlighting all the lines we wish to emphasize, and allowing what we do not, to remain in shadowed obscurity.

Italy Taxes "Dubbing"

• An Italian decree, effective November 11, 1953, which requires all foreign motion picture films to be "dubbed" (sound-synchronized) in Italy before being permitted to be exhibited in that country places a tax of 25,000 lire (at present exchange, about \$2000) on each foreign film so dubbed, according to a cablegram received in the Department of Commerce from Commercial Attache Charles A. Livingston, Rome. It is understood that proceeds of the tax are to be used for the development of the Italian motion picture industry.

Italian film producers are granted exemption from dubbing tax on three foreign films for each new national film they may produce.

Theaters in the principal cities are required to show one national film for each three foreign films shown.

Sixty days are allowed for the presentation of applications to exhibit films already dubbed or in process, but all such films are also subject to the tax.

Folsey Gets the Breaks

• George Folsey, A.S.C., is discouraged. His last picture, "Going Hollywood," is drawing "traxes" from the critics—and the other day he made a "hole in one" at golf. Still he's blue. Why? On the next round, he duplicated the shot at the same hole—but the ball bounced off the peg!



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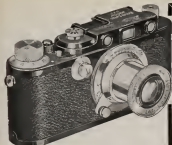
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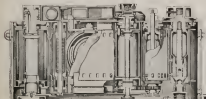
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(Above) Top cross section showing interior of the extremely accurate rangefinder. (Below) Diagram showing interior cross section of the LEICA



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Patents and the Cinematographer

(Continued from Page 358)

enough. I happen to be one of those who specialize in this branch, also, we hear more about patents and patent-litigation in this connection than in most other branches of our work, but there are countless other phases in which we work out improvements, often simply as by-products of our regular duties—methods of getting some effect we are striving for, or equipment for making our work better or easier, and a great majority of them are patentable.

I realize, too, that many cinematographers object to patenting their ideas because they wish, so to speak, to make the idea a gift to their fellow-workers. That is a laudable intention, but it is just as likely to put some one of those fellow-workers in an unpleasant spot as it is to benefit him. Suppose, for instance, that I devise some such idea, and make it known to the other members of our profession here in Hollywood. In a few years, let us say, some independent worker, somewhere else, not knowing of the idea, "discovers" it quite legitimately, and proceeds to patent it. Immediately, the fellows here who have been using the idea in their daily work are placed at a disadvantage—simply because I neglected to take the elementary step of protecting my idea, which would, in turn, protect anyone I permitted to use it.

And—don't for a minute imagine that such a thing can't happen. Our entire industry is based on scores of ideas which occurred to different individuals independently. The very film which we use was discovered that way: the official records (not to mention the records of years of litigation) show that the basic idea of coating a photographic emulsion upon a celluloid base occurred simultaneously to two individuals: neither of whom knew the other existed. George Eastman and the Rev. Hannibal Goodwin, whose applications reached the patent office only minutes apart! There is still a great deal of argument as to whether Edison or Lumiere is the Father of the Motion

Picture—their basic ideas were practically identical, their films and equipment interchangeable, and both were presented (though on opposite sides of the Atlantic) at approximately the same time. And the story is the same right down to many of the very latest innovations. DeForest in America and Tri-Ergon in Germany both showed Sound-on-Film talks ten years ago—and even then, Fritts, Lauste, and others had previously paralleled their work, as Western Electric and RCA were to later.

So, whether you wish merely to be sure of being able to use your own ideas, or to give the industry the benefit of them, the only safeguard is to patent your ideas as soon as they come to you. After all, a patent costs very little (especially when compared to even a successful lawsuit) and no matter what a patent attorney may charge, the security of a patent is worth it. In a word, the cheapest form of insurance, if your ideas are worth anything at all, is a patent. It is not, as some people have stated, an invitation to a lawsuit, nor is it a matter of useless red-tape and attorney's fees; it is insurance, pure and simple—a guarantee, backed by the Government, that your invention is truly yours, and that for seventeen years no one but you, or those you may name, may use that idea.

Miniature Camera Book

● George W. Hesse, who has contributed several articles to this magazine and other publications in the photographic field, has authored a 62-page book which is given the title "The Book of the Miniature Camera." It is published by the Fomo Publishing Company and is another of their series of 50c publications on the popular miniature camera.

The booklet touches upon many phases of miniature photography in Hesse's usual thorough manner, giving details of many small cameras, the use of enlargers, exposure meters, formulas and the many other details which the miniature enthusiast will use in the pursuit of his hobby.

As To Cinecolor

(Continued from Page 355)

incidentally, can well be made of a test-strip of the exposure chart, for even though this chart is monochromatic (gray), one may be sure that when it reproduces properly, as to tone and density, the colored portions of a correctly-exposed and developed negative will likewise be satisfactory. This method, while a marked contribution to black-and-white photography, is of special importance to color—especially black, for the reason that when using eye-judgment in

developing the two negatives, it is a simple matter to run the possibilities of obtaining balanced color positives by incorrect developing of either the back or front negatives, or both.

In using the filter method, the balance between the complementary pairs of negatives is obtained by balancing the filters, and by varying the camera shutter to each filter, the negative is, of course, developed as a whole, being on a single strip of film. In bipack developing, the two negatives being separate, different developing periods can be employed to obtain balanced negatives.

In making color positives, one has to consider making prints which will yield the greatest range of color values possible, with a two-color process, of course, the color-combinations are divided into two parts: in this case, those representing the orange-red end and the blue-green end of the spectrum colors. The Cinecolor laboratory employs double-coated or "duplized" positive film, and special dyes and printing methods whereby densities ranging from yellow to deep red, and from the palest blue through into green are obtainable. With this combination, together with correctly exposed and developed negatives, a truly remarkable range of color value is possible—in some instances being truly as close to three-color results as is conceivable with a two-color system.

In addition, the laboratory has incorporated something of an innovation in its processing machine, which not only develops, but also colors the film at a single operation, on a single machine. It is a well known fact that silver images on a positive film will vary as to density with the varying temperatures of the drying compartment. This variation is negligible as far as black-and-white films are concerned, but when the film has to be colored, it is of considerable importance, since the color-values are a function of the density of the print. Combining the processes of positive development and coloring into a single operation reduces this hazard materially, while also reducing the difficulties of handling, exposure to air and dirt, etc. This, naturally, reduces the operations of producing a color-positive to the two operations, printing and processing, the print is made in the accustomed manner, the film is placed in the processing machine, and in a remarkably short time it may be removed, developed, colored, dried, and ready for projection.

Karl Freund, A.S.C., On Vacation

• After finishing the direction of "Madame Spy" for Universal, Karl Freund, A.S.C., is taking his first vacation in fifteen years—but he reports regularly at the studio every day. Says he's been going to studios so long he doesn't know what to do at home!

Introducing Baby

(Continued from Page 354)

some institutions, father may be allowed to appear, and even to hold the baby, if he wears a surgical robe, but as this doesn't make for any great naturalness in the picture, it is advisable to leave Father completely out of the first installment.

When one plans such a film as this, he must, of course, first secure the permission of the attending physician, and of the hospital. Do not fail to ask whether or not there would be objections to your using lights, for while, generally speaking, the use of lights will probably be regarded as preferable to trying to take the baby outside, where you could work by natural light, it is well to make sure.

You will have to work quickly, so be sure to have everything arranged before you call for the baby. With a little thought, you can arrange your lights to furnish a sort of universal lighting, suitable to every shot you will have to make, with little or no modification. The accompanying diagram will indicate a very adaptable set-up of this nature.

Inasmuch as most hospital rooms or wards are fairly cramped, a 15mm. lens will prove invaluable for making such a picture. If you have a turret-camera, it is a good idea to have the 15mm., 25mm. and 50mm. (2 inch) lenses on the turret, and ready-focused, so that you can shift from one to the other quickly, rather than changing the position of the camera for each shot.

Naturally, you must work as efficiently as possible, in order to finish Baby's scenes as quickly as you can. It is, therefore, a good idea to follow professional practice, and shoot your scenes in

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(Continued on Page 340)

groups, according to the people and set-ups required. In other words, begin by doing all of the scenes in the hospital room (which do not require the baby), together. That will take care of Scenes 4, 5, 6, 21, 23, and possibly Scene 10. Scenes 1, 2 and 3, of course, can be made at any time—even before the baby is born.

The next to tackle should be Scenes 7 and 23, showing the nurse carrying the baby in and out.

Then you can swing your 25mm. lens into place, and, without moving the camera, you can account for Scene 8, and possibly Scene 10. Next, move the camera closer—to a prearranged spot—for Scene 9. This may well be made with the 2-inch lens. The same set-up should give you several of the ad lib scenes between Numbers 11 and 20. You can usually get the baby best from this angle, and, by quickly switching from one lens to another, you can put a good deal of variety into the scenes. For most of these shots, a tripod is highly desirable, as it will not only give you a steady picture, but enable you to work faster, through pre-focusing your lenses. Some of these ad libbed shots, however, may well be made without the tripod, enabling you to snap up bits of action from other angles, without delays.

The essence of the whole thing is to have every shot as carefully planned as possible, to adhere to the script, and to have everything technical—lighting, camera-placement, lens-stops, etc.—arranged beforehand, so that you won't have to give a thought to it while you have those few precious moments of shooting-time.

Supersensitive film, of course, is desirable. Then, since your various lenses will be of different apertures, plan your lighting to suit the slowest lens (which will probably be your 2-inch, most of which lenses work at about f 3.5). Next, stop down your other lenses to the same aperture—and you won't have to think about exposure.

When the film comes back from the processing-plant, all you will need to do is to splice the scenes in their proper order, slip the previously-made titles and inserts into place—and your picture is finished, with the minimum of wear and tear on all concerned!

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(Continued from Page 88)

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(Continued on Page 342)

Wheels of Industry

Hazleton Release

Among the latest 16mm picture to be marketed by Guy D. Hazleton, well known cinematographer of travel pictures, is his justly famous "On the Waves of Waikiki." This is the picture which features Nighthawk, the surfboard-riding dog. The agility and ability of this dog to cling to a bouncing surfboard is claimed to give not only an amusing touch to the picture, but also a few unusual (trills).

Goetz Meter

Based on a new principle, according to an announcement from the C. P. Goetz (American Optical Co.), that organization is marketing their new Tintex Objecto Meter. Based on a luminous disc of standard intensity it is claimed that natural as well as artificial light can be read with this meter.

Correction

In a recent issue we reported that 36 installations of Bell & Howell projectors were in use at the Century of Progress. According to information received from the Bell & Howell Company these installations numbered more than 100.

"Hot Spot" Filter

To reduce and eliminate the hot spot in background projection for process photography, George H. Scheibe, the well known Hollywood manufacturer of filters, has designed a special filter for this purpose for the Hollywood studios. This filter is said to be in wide use with the professional cameraman. It is claimed to be scientifically designed with its deepest density in the center and a gradual bleeding to a lighter tone toward the ends. This filter is used on the Process Projector. Scheibe markets this under the name of "Hot Spot Ins."

Craig Handling Ampex

Craig Movie Supply Company of Los Angeles announces that they have taken over the Southern California representation of the Ampex 16mm projector. This organization also represents the Stewart-Warner line of equipment in the west and is the well known distributor of the Thalhimer tripod and the Craig Splicer.

An added feature has been made on the new splicer, according to this company, which permits the splicing of both 16 and 8mm film with the same apparatus. **PAGE 385**

George Kelley, A.S.C., Promoted

Assistant Cinematographer George F. Kelley, A.S.C., has been promoted for the studio equivalent of "gallantry under fire." During the making of a scene at the Columbia Studio recently, the heavy door of the "blimp" came open, knocking Operative Cinematographer Henry Freulich, A.S.C., unconscious. Kelley held the door shut, and finished the scene. Now it's "Operative Cinematographer Kelley."

Charles C. Clarke, A.S.C. To China

Charles C. Clarke, Vice President of the American Society of Cinematographers, has been sent to China by Metro-Goldwyn-Mayer, to film special scenes and backgrounds for Irving Thalberg's production "The Good Earth," which will be directed by George Hill, a former A.S.C. member. Clarke will be in China for some time, and there is a possibility that the entire production may be made there. Mrs. Clarke is accompanying her husband on this trip.

What A Life!

Some folks might think it good luck—but not Second Cinematographer Cliff Blackstone, A.S.C. "As soon as I finished 'Eight Girls in a Boat,' he complains, 'the studio assigned me to help Milton Krasser, A.S.C., finish 'Sitting Pretty'—a musical with over a hundred choruses. Won't I ever get away from these women?'"

Planes Safer For Dyer

Aerial Cinematographer Elmer G. Dyer, A.S.C., is fed up with automobiles—they're too dangerous. After flying hundreds of thousands of miles making air-films, Dyer had an accident that laid him up for weeks—in an auto. "Me for the sky," says Dyer, "I want to play safe!"

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Problems of Background Projection

(Continued from Page 352)

the screen and the hot-spot condition is apparent to the observer or camera from any position which is directly in line with the projector, or which is the zero angle. The illumination decreases from this point as the angle increases to the edge of the screen so that regardless of what distance the beam is thrown there is always a zero angle and a maximum angle.

With the above in mind it is apparent that there is very little hope for a correction of the condition in any type of translucent screen which leaves the only other alternative, to change the character of the projected beam itself in order to progressively increase the illumination from the center of the projection screen to the edge in order to compensate for angle loss.

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You want The Cinematographic Annual

The illustration shows means of opti-
 cally accomplishing this requirement and
 may be used either on the step printer
 to compensate for the hot-spot by making
 a master compensated negative or on the
 background projector itself.

The function of this optical system is to
 increase the efficiency of the con-
 densing system to a certain extent by
 lowering the angle of the illumination
 which passes through the projection lens
 and using a first relay condenser in com-
 bination with a second relay condenser.
 The second relay condenser is an aspheric
 lens-like shape and progressively changes
 the central rays toward the edge of the

screen, so that a maximum illumination
 is on the edge of the screen and the
 minimum in the center. The amount of
 divergence necessary from this lens is, of
 course, dependent upon the loss occu-
 pation by the various steps in the process
 which have been mentioned, and it has
 been the experience of this writer that
 on comparatively short throw projection
 and using a celluloid screen of normal
 diffusion there must be from 2 to 4 times
 as much illumination on the edge of the
 screen as in the center in order to give
 the screen the appearance of uniform
 illumination from the camera side.

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